Jennifer Campbell

From: Jennifer Campbell
Sent: Thursday, November 21, 2019 3:58 PM
To: Hackler, Pam
Cc: 'Herrington, Karen (karen_herrington@fws.gov)'
Subject: RE: COMMENTS: Labadie Generating Station 316(a)

Hi Pam,

Thanks for your message and follow-up questions. Green font describes my understanding of these issues, though I have not been able to connect with technical staff today. It seems like you generally understood from the draft you circulated earlier today for comment. I am available by phone to discuss.

Thanks also for your commitment to involving us in the earlier stages of these studies moving forward!

Thanks,
Jennifer

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3. A thermal variance for six percent of the year represents 22 days. If these days were consecutive, that could be a consideration for fishery resources. *Please provide clarification. What considerations would they need to provide?*

   There could be fish mortality associated with 22 consecutive days of the proposed thermal variance discharges. My understanding is the thermal variance will raise the temperature at the end of the mixing zone above 90°F (32.2°C). As noted in our comment #4, fish mortality was observed at the high end of the thermal tolerance studies (35°C/95°F), depending on the **duration** and **previous acclimation temperatures.**

   Twenty-two consecutive days (22) is an extended **duration** for a fish stressor. The temperature range that is subject of this variance (32.2°C and above) is already associated with negative feeding impacts for sturgeon. A long duration thermal variance event is a potential concern for the fishery.

   In your attached email, I believe you describe that the thermal discharges that would be allowed under the proposed variance could allow end-of-pipe discharge temperatures could be as high as 113.7 °F (45.38°C). If I understood your message correctly, the difference between ambient river temperature and discharges could be 42.4°F difference, 10.3°F difference, and 9.38°F difference. While I am not clear if that is for the mixing zone or at the compliance point at the end of the mixing zone, a water temperature change (from **prior acclimation temperature** vs. discharge temperature) of

40°F could easily create a thermal shock for fish and result in fish mortality. I would wonder if a 10°F change could also create thermal shock for certain temperature-sensitive species, depending on other factors.

6. Hydrographs for both the Hermann Gage and the Labadie Gage show that water temps usually peaked in July-August around 30-32 degrees C. Ambient water temperatures naturally reach the feeding impact temperatures. *What does this mean in relation to the study? Is there already some feeding inhibition occurring?*

   I was curious how close the ambient river temperatures were to 90°F, above which a thermal variance might be needed. We looked at the last few years of river temperatures at these gages and noticed some portions of the year (July-August) had river temperatures 86-89.6°F, which is within the range of documented feeding impacts (above 87.8°F for young sturgeon), but generally not exceeding 90°F.

   It is interesting that thermal exceedances occurred historically also in November, given that the volumetric contribution of discharge water is supposed to be less than 40% of the river flow (correct me if wrong) and that ambient river temperatures should be much lower at that time of year.

From: Hackler, Pam [mailto:pam.hackler@dnr.mo.gov]
Sent: Tuesday, November 19, 2019 8:38 AM
To: Jennifer Campbell <Jennifer.Campbell@mdc.mo.gov>
Cc: 'Herrington, Karen (karen_herrington@fws.gov)' <karen_herrington@fws.gov>
Subject: RE: COMMENTS: Labadie Generating Station 316(a)

Hello Jennifer,

Thank you very much for the comments. I have highlighted a couple questions below. Can you provide clarifications? Also, I will make sure to keep MDC involved at the initial stages of these studies in the future.

Thanks,
Pam

Pam Hackler

Pam Hackler, Environmental Scientist
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Water Protection Program; Industrial Wastewater Unit; NPDES Permitting
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Email:pam.hackler@dnr.mo.gov

My normal office hours are from 7-3:30 M-F. Thanks!

From: Jennifer Campbell <Jennifer.Campbell@mdc.mo.gov>
Sent: Sunday, November 17, 2019 11:28 PM
To: Hackler, Pam <pam.hackler@dnr.mo.gov>
Cc: 'Herrington, Karen (karen_herrington@fws.gov)' <karen_herrington@fws.gov>
Subject: COMMENTS: Labadie Generating Station 316(a)

Pam,

Thanks for the opportunity to comment on the Final Demonstration Report (Demonstration) and proposed 316 variance for the Labadie Plant in Franklin County, Missouri.

Based on my understanding of the materials presented in the Demonstration, the applicant proposes that discharges from the Labadie Plant:

- Could raise Missouri River temperature higher than 90 degrees, once beyond the mixing zone, under certain conditions as follows.

- Up to 6% of days in any calendar year could have thermal exceedances when ambient river temperatures are greater than 87 degrees F or when the Missouri River flow is less than 40,000cfs. These 6% could be consecutive days.
- The discharge under these conditions must result in a mixing zone less than 40% of river volume (equations in permit).

The Demonstration is intended to determine whether the alternative effluent limits for temperature will assure the protection and propagation of the balanced indigenous (fish) community (page I). According to page V of the report, USEPA's indicators of Appreciable Harm include "no increase in nuisance species." Indigenous species are described on page 3-3, and seem to include those endemic to a waterbody, but also those specifically managed (such as intentional stocking of sport fish). The Demonstration evaluated data collected on two dates (June 22, 2006 and July 21, 2006) over a 17-year period of record. The rationale described for these dates was they occurred during the most extreme conditions during the "most biologically active period" (page 6-2). The report notes that the "avoidance temperatures" of pallid sturgeon are "not known" (page V).

The Missouri Department of Conservation (Department) is the agency responsible for fish, forest and wildlife resources in Missouri. The Department actively participates in reviews when projects might affect those resources and appreciates the opportunity to provide comments on this project. The following comments and suggestions are offered to avoid, minimize, and where necessary mitigate impacts to fish, forest, and wildlife resources:

1. As acknowledged in Table 2-11, the previous thermal exceedances occur in July, August, and November.

2. The documented previous thermal exceedance months (July, August, November) are not aligned with the selected "most biologically active period" demonstration dates (in June and July, referenced Page 6-2). By selecting demonstration dates in June and July, potentially important data would be excluded (August, November). Excluding these data might result in inaccurate conclusions.

3. A thermal variance for six percent of the year represents 22 days. If these days were consecutive, that could be a consideration for fishery resources. Please provide clarification. What considerations would they need to provide?

4. Information about the thermal limits of other sturgeon species included Age-0/1 lake and shortnose sturgeon that showed limits of 31-35 degrees C (87.8 – 95 degrees F). At the low end of the temperature ranges feeding behavior is impacted negatively and at the upper end can be lethal depending on previous acclimation temperatures and duration. In the fish hatchery setting, it has been reported that developmental issues among immature sturgeon may occur over 26 degrees C.

5. An added challenge for fishery resources is that the higher the water temperature, the lower the natural concentration of dissolved oxygen gas in the water at standard pressure. For example, at 35 degrees C, the 100% saturation point is around 7 mg/L; it is below 6 mg/L at 45 degrees C. Dissolved oxygen is needed for fish respiration. Also, as temperatures increase, fish respiration increases and consumes more dissolved oxygen.

6. Hydrographs for both the Hermann Gage and the Labadie Gage show that water temps usually peaked in July-August around 30-32 degrees C. Ambient water temperatures naturally reach the feeding impact temperatures. What does this mean in relation to the study? Is there already some feeding inhibition occurring?

7. The Demonstration describes that pallid sturgeon would avoid the thermal discharge zone at Labadie, and would not use shoreline habitat most affected by thermal events. It should be noted that Labadie Plant is located on the outside bend of the Missouri River, where the thalweg occurs. As noted in page 6-39, the species is known to use deeper channel areas (a.k.a. the thalweg). Drifting larval pallid sturgeon would not have adequate motility to avoid thermal mixing zones, and this life stage of the pallid sturgeon is known to be carried in the thalweg.

8. The Demonstration describes not increasing the prevalence of additional invasive species (p6-7) as evidence that the demonstration period with thermal variances successfully operates without detriment to the fishery. How would the analysis describe the prevalence of invasive/nuisance species if include Asian Carp were included in this group? We consider them an invasive species and do not stock them as a sport fish. They could be considered a nuisance species.

9. If the Department had been consulted about this study, we would have recommended including commercial fish (big mouth buffalo, etc) since other groups were included (invasive, game fish, prey fish, endangered, etc).

10. Regrettably I did not have time to discuss with our biometricians whether there were potentially other ways to utilize or interpret the original study data.

11. It is my understanding that in the past MDC has the opportunity to comment on permits in the earlier stages of permitting, such as before studies have been conducted. There was no opportunity to comment before the studies were conducted.

Thanks for the opportunity to provide these comments.

JENNIFER K. CAMPBELL
POLICY COORDINATOR

From: Hackler, Pam [mailto:pam.hackler@dnr.mo.gov]
Sent: Tuesday, October 15, 2019 12:11 PM
To: Herrington, Karen (karen_herrington@fws.gov) <karen_herrington@fws.gov>; Jennifer Campbell <Jennifer.Campbell@mdc.mo.gov>
Subject: Labadie Generating Station 316(a)

Good morning,

Attached is the first part of the CWA 316(a) draft demonstration request for the Ameren Labadie Generating station. Section 316(a) of the Clean Water Act allows facilities to obtain a variance from the water quality standards if the facility can show there is no harm to the local aquatic community. We kindly request a review of this report as soon as possible; the facility is asking for a meeting in two weeks. If you choose not to review the report, please let me know. The EPA and our biologists are reviewing as

well. There are other documents with the submittal if you would like them; they are large files and will have to be condensed to send via email.

Thanks,
Pam

Pam Hackler

Pam Hackler, Environmental Scientist
Missouri Department of Natural Resources
Water Protection Program; Industrial Wastewater Unit; NPDES Permitting
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My normal office hours are from 7-3:30 M-F. Thanks!